

## **Personal Attitudes toward Weight in Overweight and Obese U.S. Hemodialysis Patients**

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## **ABSTRACT**

### **Personal Attitudes toward Weight in Overweight and Obese U.S. Hemodialysis Patients**

**Objective:** Overweight and obesity have become increasingly common among end-stage renal disease (ESRD) patients on hemodialysis. Yet little attention has been given to what hemodialysis patients themselves think of their weight, how they perceive it affects their health, and their attitudes about or desire for weight reduction. We explored these issues using a survey that we designed specifically for the dialysis population.

**Design and Subjects:** Sixty-six chronic hemodialysis patients from a US urban center with a body mass index (BMI) of 25 or greater and stable weight were recruited to participate in a cross-sectional study. The twelve question weight-related survey was validated by re-testing a random portion of the study population.

**Results:** Based on test-retest results the survey had good to excellent validity. 79% of patients were black, 49% were male, 29% were overweight, and 71% were obese. In general the patients underestimated their weight excess though 73% were interested in weight loss, of whom nearly half reported attempting to do so mostly through diet and exercise. The majority of participants interested in losing weight felt that doing so would improve their physical and emotional health. The most common barrier to weight reduction was a belief that it was too difficult (55%), followed by a lack of motivation, money, time, resources, and knowledge. Diet was the most common weight loss strategy (85%) considered while bariatric surgery was the least common (6.1%).

**Conclusions:** A majority of overweight and obese hemodialysis patients believe their excess weight is adversely impacting their health and quality of life and therefore wish to lose weight.

**Keywords:** end-stage renal disease, hemodialysis, obesity, overweight, self-perception, survey

## INTRODUCTION

Obesity is an increasingly relevant issue for the US end-stage renal disease (ESRD) population. Over the past few decades obesity rates have risen to the point where nearly 40% of US incident hemodialysis patients are obese with an additional 25% being overweight(1). Moreover, the rate of rise in obesity has outstripped that observed in the general populace(2).

The health impact of excess weight in ESRD patients is likely significant but not fully understood(3). Numerous observational studies have linked obesity to a lower rate of mortality and weight loss to an increased risk of death(4). This phenomenon, dubbed the “obesity paradox,” has been seen in other chronically ill populations(5). Of note, these reports reveal epidemiological associations but do not prove causation nor do they differentiate between intentional and unintentional weight loss. On the other hand, the presence of obesity lowers the likelihood of being waitlisted for kidney transplantation(6, 7). Intentional weight loss also offers the potential of improving quality of life and/or ameliorating illnesses as in the general populace, though studies demonstrating this are thus far lacking.

Studies of personal attitudes of overweight or obese patients toward their weight and its relation to health status have been performed in the greater population(8, 9). In contrast, little attention has been given to how overweight and obese hemodialysis patients feel about their weight and how they believe it influences their health and attempts to lose weight. Understanding these issues are necessary to managing excess weight effectively in such patients. We therefore characterized the views of overweight and obese US hemodialysis patients on a range of topics related to their weight using a survey we designed precisely for this purpose.

## **METHODS**

### **Design**

In 2015 we conducted a cross-sectional study in three hemodialysis units in downtown Indianapolis, Indiana. All participants gave written informed consent after approval by the Institutional Review Board.

### **Participants**

The study population included individuals 18 years or older with ESRD currently receiving outpatient hemodialysis. The study was limited to overweight and obese individuals with a body mass index (BMI) of 25 or greater (i.e. overweight or obese)(10). Patients with 7.5% or greater weight loss over the preceding 3 months or who could not understand the survey questions due to cognitive limitations were excluded.

### **Weight Survey**

We drafted a twelve question survey aimed at measuring personal opinions related to weight-related issues in hemodialysis patients. The survey is found in the Supplementary material.

Although the questionnaire was largely self-administered, when necessary the questions were read out to those with reading disabilities.

### **Analysis**

Reliability of the survey was assessed by repeating the survey at least four weeks apart in a random selection of 20% of the study population. Each item was then analyzed for agreement.

The reliability co-efficient Kappa was used for all binary data while weighted Kappa using the Fleiss-Cohen quadratic weights was employed for ordinal categorical data. A Kappa value of 1 indicates perfect agreement while 0 indicates the agreement was no better than chance. Intra-class correlation coefficient (ICC) using the absolute agreement version with occasions specified as a random effect was used for continuous items. Basic descriptive data were obtained to capture population demographics. When the data was not normally distributed we used non-parametric tests (Mann-Whitney for continuous variables, chi-square for nominal data). P-value was considered significant at  $<0.05$ . SPSS (Version 24, Armonk, NY) was used for the analysis.

## RESULTS

A total of 78 patients were evaluated for study entry. Of these, 12 individuals were either not interested in participating, met exclusion criteria, or were hospitalized at the time, leaving a final study population of 66 patients. Basic demographics can be seen in Table 1. The great majority of the participants were black and slightly more than half were women and had diabetes. The great majority (71.2%) of participants were obese, with 39% of the patients having more severe (class 2 or 3) obesity(10).

Fourteen of the 66 patients were randomly selected to re-take the questionnaire at least four weeks apart to test its reliability. Table 2 shows the Kappa values for agreement along with the ICC for each of the 12 survey items. The lowest Kappa value was 0.4 with most responses ranging between 0.6-0.8. Based on previous scaling methods(11), the survey had good to excellent validity. The ICC values indicate excellent agreement.

Figure 1 compares each patient's perceived body size with their actual BMI. In general, the patients underestimated their weight excess, with nine percent of the patients considering themselves underweight, two-thirds considering themselves somewhat overweight, and only one in every five considering themselves very overweight or obese.

Of the 44 patients who perceived themselves as overweight, 25% felt their weight rose after starting dialysis. Of note, 48 (73%) patients were interested in losing weight, including 4 patients who considered their weight to be "just right". The average desired weight loss was  $18.6 \pm 14.5$  kg (range: 3.6 – 68.6 kg). Of the 48 patients interested in losing weight, 23 reported trying to lose weight since starting dialysis, of whom 21 felt that they were at least somewhat successful. The average reported weight loss achieved was  $14.5 \pm 9.5$  kg (range: 2.2-45.9 kg). Weight loss strategies used included diet (21 patients), exercise (13 patients) and medications (1 patient).

Figure 2 lists in order of popularity the reasons patients wanted to lose weight, with physical inactivity and fatigue being the most cited. The majority (85%) felt it would make them healthier, an observation reflected in Figure 3, which describes the medical problems believed related to excess weight. Perceived barriers to weight loss are shown in Figure 4. The most common barrier was a belief that weight loss was too difficult (55%), followed by a lack of motivation, money, time, resources, and knowledge. The most common weight loss strategy considered by the patients was diet, followed by exercise, education, and medications (Table 5). Only 6% of patients considered surgery as a weight loss strategy.

Of note, there were no statistically significant differences in BMI categories or survey responses between men and women, black or white individuals, or patients with or without diabetes.

## **DISCUSSION**

Our study offers new information on how overweight and obese US hemodialysis patients perceive and manage their weight. In light of the high prevalence of excess adiposity in the US hemodialysis population(1) these insights are relevant to contemporary dialysis practice.

Research into the impact of overweight or obesity in hemodialysis patients has thus far largely focused on epidemiological outcomes. Aside from observational studies (which are vulnerable to confounding and other methodological limitations)(3, 12) that describe an inverse association between adiposity and death(3), there is little information on how excess weight influences quality of life or other important clinical outcomes such as heart disease, stroke, type 2 diabetes, hypertension, and rates of hospitalization or death. Nor has there been great interest in what overweight or obese dialysis patients think of their own weight, how they perceive it impacts their lives, and their views on weight loss. This information is important to help design effective weight reduction strategies that could influence patient outcomes. In fact, aside from one study reporting that only five of fifteen Romanian hemodialysis patients correctly perceived their true weight status(13), the literature in this area is nonexistent. Because the dialysis experience is unique, we designed and validated a new weight-related survey specifically tailored for dialysis patients.

The tendency for our patients to underestimate their own weight status was notable. This is consistent with previous findings that Americans in general, and blacks in particular (who comprised 79% of our cohort), increasingly underreport their weight status(14). While this would be expected to lower the proportion of patients who want to lose weight, 73% of our cohort in fact expressed an interest in weight reduction.

Among the perceived health problems associated with excess weight were issues that plague the hemodialysis population; namely inactivity, fatigue, reduced independence, and depression. Whether successful weight reduction can improve these problems remains to be seen, though this is what appeared to have motivated many study participants to try and lose weight. This perception is notable in light of the growing importance placed on quality of life in dialysis patients by health care practitioners and regulatory agencies(15). Interestingly, one quarter of patients reported that they gained weight after initiating dialysis. This is contrary to the common perception that weight loss invariably occurs after starting dialysis.

Perceived barriers to weight reduction were similar to what is described in the general population, including lack of motivation, resources, time, and knowledge(16, 17). Over one-third of the 73% of patients who wished to lose weight attempted to do so, mostly through the standard strategies of diet and exercise(18). Notably, only about 20% of participants reported considering using weight loss medications. In addition, 6% of patients considered undergoing bariatric surgery, the most effective and sustained weight reduction strategy(19), despite 39% of them having BMIs that would make them eligible. We suspect this is in large part a result of lack of familiarity and knowledge about this treatment modality on the parts of both the patient and



their health care providers, though negative experiences after previous surgeries that involved prolonged rehabilitation were also voiced.

Our study has several strengths, including the development and validation of a new weight-related survey geared towards dialysis patients. Our “patient-centric” approach to understanding how patients perceive issues related to their weight is a strategy that offers new insights and is increasingly desired by the dialysis community. Our findings can also help to design randomized weight loss trials in ESRD, which are needed to better understand obesity’s impact on clinical outcomes. Limitations also exist. The study is of modest size and is comprised of mostly black, inner city residents. Whether their responses reflect the views of the greater dialysis population will need to be confirmed in future studies.

The results of this exploratory, qualitative analysis suggest that a majority of overweight and obese hemodialysis patients believe their excess weight is adversely impacting their health and quality of life and therefore wish to lose weight. However, we also found that excess weight is underestimated and that bariatric surgery is rarely considered. We believe these preliminary results offer new opportunities for patient and provider education and the design of weight loss interventions designed to improve quality of life and clinical outcomes.

## **CONCLUSION/PRACTICAL APPLICATION**

The majority of obese and overweight hemodialysis patients are interested in losing excess weight. Our preliminary results offer new opportunities for patient and provider education and the design of weight loss interventions to improve quality of life and other clinical outcomes.

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## **FIGURES LEGEND**

**Figure 1: Perceived Body Size Compared with Actual BMI**

**Figure 2: Perceived Health Problems from being Overweight**

**Figure 3: Reasons for Wanting to Lose Weight**

**Figure 4: Perceived Barriers to Weight Loss**

**Figure 5: Weight Loss Strategies Patients have Considered**











